

Amendments to the Claims:

The following listing of claims replaces all prior versions and listings of the claims in the present application.

Listing of the Claims:

1. (currently amended) A device for ~~analyzing a~~ measuring the thickness of a layer of cartilage located on subchondral bone-tissue, said device comprising:

a at least one light ~~generating means~~ source;

a probe ~~with an extension;~~

at least one fiber bundle ~~arranged in said extension;~~ configured for conveying light from said at least one light ~~generating means~~ source to the surface of ~~said tissue~~ the cartilage when said probe is positioned adjacent to the cartilage, without disrupting the surface of the cartilage;

a light ~~detecting means~~ detector; and

a signal processor configured to determine ~~said the~~ thickness of ~~said tissue~~ the cartilage based on data acquired by said light ~~detecting means~~ detector;

wherein:

said ~~at least one light ~~generating means~~ source~~ generates light of known intensity, of a plurality of wavelengths,

~~said extension is designed for conveying light back scattered from said tissue to said light detecting means,~~

said light ~~detecting means~~ detector is ~~designed~~ configured for measuring the intensity of light back-scattered from ~~said tissue~~ the cartilage and the underlying subchondral bone for at least two of said plurality of wavelengths, ~~components of said tissue are cartilage and subchondral bone,~~ and

said signal processor is ~~arranged~~ configured to determine the cartilage thickness based on predetermined optical properties of ~~the~~ cartilage and ~~underlying~~ subchondral bone at said at least two ~~plurality of~~ wavelengths, and based on the measured intensity of the back-scattered light at said at least two wavelengths.

2-3. (Cancelled)

4. (currently amended) The device according to claim 1 wherein said at least one light ~~generating means includes means for generating~~ source is configured to generate light of said at least two wavelengths including which include a reference light wavelength and a measurement light wavelength, ~~where said reference light and measurement light are conveyed through said fiber bundle in said extension for illumination of said tissue surface~~, wherein said light ~~detecting means~~ detector is ~~designed~~ configured to measure intensities of back-scattered light parts of at said reference light wavelength and said measurement light wavelength, and further wherein said signal processor ~~includes means for comparing~~ is configured to compare said measured intensities of back-scattered reference light and measurement light in order to determine the thickness of ~~said tissue~~ the cartilage.

5. (currently amended) The device according to claim 4 wherein said light ~~detecting means~~ detector is a two-dimensional intensity detector.

6. (currently amended) The device in accordance with claim 4 wherein said at least one light ~~generating means~~ source is a white light source for visualization of ~~said tissue~~ the cartilage, and said reference light and measurement light wavelengths are extracted from said white light source by a material selected to pass said reference light and measurement light wavelengths.

7. (currently amended) The device in accordance with claim 4 comprising means for multiplexing said reference light and measurement light emitted from said at least one light ~~generating means~~ source.

8. (currently amended) The device according to claim 1 wherein said at least one light ~~generating means~~ is a light source is configured to ~~generating~~ generate white light, wherein said white light from said at least one light source is conveyed through said fiber bundle ~~in said extension~~ for illumination of ~~said tissue~~ the cartilage, ~~where said light detecting means is~~

~~designed to measure intensities of back scattered parts of said white light for at least two wavelengths, and wherein said signal processor includes means for comparing~~ is configured to compare said measured intensities at said at least two the wavelengths of said reference light and measurement light in order to determine the thickness of ~~said tissue~~ the cartilage.

9. (currently amended) The device according to claim 8 wherein said light ~~detecting means~~ detector is a two-dimensional intensity detector.

10. (currently amended) The device in accordance with claim 1 wherein said at least one light generating means ~~includes means for generating~~ source is configured to generate light of at least two wavelengths including a reference light wavelength and a measurement light wavelength, ~~where such that said generated light reference light and measurement light are is~~ conveyed through said fiber bundle ~~in said extension~~ for illumination of ~~said tissue~~ the cartilage, and further wherein the device is configured such that said extension is designed for conveying light back-scattered from ~~said tissue~~ the cartilage and the underlying subchondral bone is conveyed back to an eye-piece for visual inspection.

11. (currently amended) The device according to claim 10 wherein said at least one light generating means ~~is a white~~ light source is configured to generate white light for visualization of ~~said tissue~~ the cartilage, and said reference light and measurement light wavelengths are extracted from said white light source by a material selected to pass said reference light and measurement light wavelengths.

12. (currently amended) The device in accordance with claim ~~40~~ 11 comprising means for multiplexing said reference light and measurement light emitted from said at least one light generating means source.

13. (currently amended) The device in accordance with claim 4 wherein ~~the wavelength of~~ said reference light wavelength is within a wavelength region wherein similar absorption between ~~the components of said tissue~~ cartilage and bone is seen.

14. (currently amended) The device according to claim 13 wherein ~~the wavelength~~ of said reference light wavelength is within the 600-800 nm wavelength range.

15. (currently amended) The device in accordance with claim 4 wherein ~~the wavelength of~~ said measurement light wavelength is within a wavelength region wherein differences in absorption between ~~the components of said tissue~~ cartilage and bone are seen.

16. (currently amended) The device according to claim 15 wherein ~~the wavelength~~ of said measurement light wavelength is within a wavelength region corresponding to a hemoglobin absorption peak, in the vicinity of 425, 542 or 576 nm, or within a wavelength region with high water absorption, ~~preferably in the near-infrared region.~~

17-30. (Cancelled)

31. (currently amended) A method for ~~analyzing tissue~~ measuring the thickness of a layer of cartilage located on subchondral bone, said tissue including cartilage and bone, said method comprising:

illuminating the surface of the cartilage with light of a plurality of wavelengths, without disrupting the surface of the cartilage;

measuring light the intensity of a reference light back-scattered from the cartilage and the underlying subchondral covered bone for at least two of said plurality of wavelengths;

measuring light intensity of a measurement light back scattered from said cartilage covered bone; ———

determining a relationship between the intensity of the back-scattered reference light and the intensity of the back-scattered measurement light; and

deriving determining cartilage thickness based on the determined relationship and based on predetermined optical properties of the cartilage and underlying subchondral bone at said two of more of said plurality of wavelengths, and based on the intensity of the back-scattered light at said two or more of said plurality of wavelengths.

32. (currently amended) The device in accordance with claim 8, wherein the wavelength of one of said reference light at least two wavelengths is within a wavelength region where similar absorption between ~~the components of said tissue~~ cartilage and bone is seen.

33. (currently amended) The device in accordance with claim 10, wherein ~~the wavelength of said reference light~~ wavelength is within a wavelength region where similar absorption between ~~the components of said tissue~~ cartilage and bone is seen.

34. (currently amended) The device in accordance with claim 8, wherein the wavelength of one of said measurement light at least two wavelengths is within a wavelength region wherein differences in absorption between ~~the components of said tissue~~ cartilage and bone are seen.

35. (currently amended) The device in accordance with claim 10 wherein ~~the wavelength of said measurement light~~ wavelength is within a wavelength region wherein differences in absorption between ~~the components of said tissue~~ cartilage and bone are seen.

36. (new) The device in accordance with claim 32 wherein said wavelength region is within the 600-800 nm wavelength range.

37. (new) The device in accordance with claim 33 wherein said reference light wavelength is within the 600-800 nm wavelength range.

38. (new) The device in accordance with claim 34 wherein said wavelength region corresponds to a hemoglobin absorption peak, in the vicinity of 425, 542 or 576 nm, or to a wavelength region with high water absorption.

39. (new) The device in accordance with claim 35 wherein said measurement light wavelength is within a wavelength region corresponding to a hemoglobin absorption peak, in the vicinity of 425, 542 or 576 nm, or within a wavelength region with high water absorption.

40. (new) The method of claim 31, wherein said step of illuminating the surface of the cartilage with light of a plurality of wavelengths comprises illuminating the cartilage with white light.

41. (new) The device in accordance with claim 5 wherein said two-dimensional intensity detector is a CCD camera.

42. (new) The device in accordance with claim 9 wherein said two-dimensional intensity detector is a CCD camera.